

CLAIMS

1. An ink set comprising a dark ink composition  
and a light ink composition that, while being mutually of  
same color, are of different color density; characterized  
5 in that:

said dark ink composition and said light ink  
composition each at least contains a pigment as a  
colorant and a resin as a dispersant;

ratio between resin weight proportion  $B_1$  and  
10 pigment weight proportion  $P_1$  ( $B_1/P_1$ ) in said dark ink  
composition is lower than ratio between resin weight  
proportion  $B_2$  and pigment weight proportion  $P_2$  ( $B_2/P_2$ ) in  
said light ink composition; and

said resin weight proportion  $B_1$  in said dark ink  
15 composition and said resin weight proportion  $B_2$  in said  
light ink composition differ from each other.

2. The ink set according to claim 1, characterized  
in that relationship between said resin weight proportion  
 $B_1$  in said dark ink composition and said resin weight  
20 proportion  $B_2$  in said light ink composition is  $B_1 > B_2$ .

3. The ink set according to claim 1, characterized  
in that relationship between said resin weight proportion  
 $B_1$  in said dark ink composition and said resin weight  
proportion  $B_2$  in said light ink composition is  $B_1 < B_2$ .

25 4. The ink set according to any one of claims 1 to  
3, characterized in that difference between ratio between

resin weight proportion  $B_2$  and pigment weight proportion  $P_2$  ( $B_2/P_2$ ) in said light ink composition, on one hand, and ratio between resin weight proportion  $B_1$  and pigment weight proportion  $P_1$  ( $B_1/P_1$ ) in said dark ink composition, 5 on other hand, is from 0.01 to 0.5.

5. An ink set comprising a dark ink composition and a light ink composition that, while being mutually of same color, are of different color density; characterized in that:

10 said dark ink composition and said light ink composition each at least contains a pigment as a colorant and fine polymer particles;

ratio between fine polymer particle weight proportion  $E_1$  and pigment weight proportion  $P_1$  ( $E_1/P_1$ ) in 15 said dark ink composition is lower than ratio between fine polymer particle weight proportion  $E_2$  and pigment weight proportion  $P_2$  ( $E_2/P_2$ ) in said light ink composition; and

said fine polymer particle weight proportion  $E_1$  20 in said dark ink composition and said fine polymer particle weight proportion  $E_2$  in said light ink composition differ from each other.

6. The ink set according to claim 5, characterized in that relationship between said fine polymer particle 25 weight proportion  $E_1$  in said dark ink composition and said

fine polymer particle weight proportion  $E_2$  in said light ink composition is  $E_1 > E_2$ .

7. The ink set according to claim 5, characterized in that relationship between said fine polymer particle weight proportion  $E_1$  in said dark ink composition and said fine polymer particle weight proportion  $E_2$  in said light ink composition is  $E_1 < E_2$ .

8. The ink set according to any one of claims 5 to 7, characterized in that ratio between said fine polymer particle weight proportion  $E_1$  and pigment weight proportion  $P_1$  ( $E_1/P_1$ ) in said dark ink composition is 0.05 to 1.0, and ratio between said fine polymer particle weight proportion  $E_2$  and pigment weight proportion  $P_2$  ( $E_2/P_2$ ) in said light ink composition is 0.2 to 4.0.

9. The ink set according to any one of claims 1 to 8, characterized in that said dark ink composition is a cyan ink composition and/or a magenta ink composition, and said light ink composition is a light cyan ink composition and/or a light magenta ink composition.

10. The ink set according to claim 9, characterized in that colorant in both said cyan ink composition and said light cyan ink composition is a cyan pigment, and colorant in both said magenta ink composition and said light magenta ink composition is a magenta pigment.

11. The ink set according to claim 10, characterized in that said cyan pigment is one or more

types selected from a group consisting of C.I. pigment  
blue 15:3, 15:4, and 60, and said magenta pigment is one  
or more types selected from a group consisting of C.I.  
pigment red 122, 202, and 209, and C. I. pigment violet  
5 19.

12. The ink set according to any one of claims 9 to  
11, further comprising a yellow ink composition and/or a  
black ink composition.

13. The ink set according to claim 12 characterized  
10 in that colorant in said yellow ink composition is one or  
more types of yellow pigment selected from a group  
consisting of C.I. pigment yellow 74, 93, 109, 110, 128,  
138, 150, 151, 154, 155, 180, and 185, and colorant in  
said black ink composition is carbon black.

15 14. An ink set comprising water-based pigment inks  
of at least six different colors, namely of black, cyan,  
magenta, yellow, light cyan, and light magenta,  
characterized in that:

each of said water-based pigment inks of said  
20 six different colors contains a pigment as a colorant and  
a solvent;

at least said water-based inks of light cyan  
color and light magenta color each contains an emulsion  
having fine polymer particles as dispersoid; and  
25 said emulsions exhibit minimum film producing  
temperatures of 25°C or lower.

15. The ink set according to claim 14,  
characterized in that each of said water-based pigment  
inks of light cyan color and light magenta color contains  
0.1 to 40 wt.% of said fine polymer particles.
- 5 16. The ink set according to claim 14 or claim 15,  
characterized in that total quantity of said pigment and  
said fine polymer particles contained in said water-based  
pigment inks, respectively, is 0.5 to 45 wt.%.
- 10 17. The ink set according to any one of claims 14  
to 16, characterized in that average particle size of  
said fine polymer particles is 5 to 200 nm.
18. The ink set according to any one of claims 14  
to 17, characterized in that glass transition temperature  
of said fine polymer particles is -15 to 10°C.
- 15 19. The ink set according to any one of claims 14  
to 18, characterized in that each of said water-based  
pigment inks of six different colors contains a  
dispersant, and a content of this dispersant is 0.1 to 5  
wt.%.
- 20 20. The ink set according to claim 14,  
characterized in that viscosity of each of said water-  
based pigment inks of six different colors at 20°C is from  
1 to 10 mPa·s.
- 25 21. The ink set according to any one of claims 14  
to 20, characterized in that surface tension in each of

said water-based pigment inks of six different colors, is  
15 to 50 mN/m.

22. The ink set according to any one of claims 14  
to 21, characterized in that said ink set is used in  
5 forming text and/or images on special ink jet recording  
paper.

23. An ink jet recording method for performing  
printing by discharging liquid drops of an ink  
composition and causing said ink drops to adhere to a  
10 recording medium, characterized in that:

the ink composition of any of the ink sets  
cited in claims 1 to 22 is used as said ink composition.

24. A recording characterized in that said  
recording is recorded by an ink jet recording method  
15 wherein liquid drops of an ink composition are discharged  
and those liquid drops are caused to adhere to a  
recording medium, using the ink set cited in any one of  
claims 1 to 22.

25. An ink cartridge characterized in that the ink  
20 set cited in any one of claims 1 to 22 is integrally  
accommodated therein.

ABSTRACT

An ink set, exhibiting good ink permeability and fixation, capable of yielding high quality images with no roughness, or an ink set capable of yielding text and/or  
5 images of outstanding light resistance, is provided. The ink set of the present invention comprises a dark ink composition and a light ink composition that, while being mutually the same color, are of different color density, and is characterized in that the dark ink composition and  
10 the light ink composition each comprise a pigment as a colorant and a resin as a dispersant, in that the ratio between the resin weight proportion  $B_1$  and the pigment weight proportion  $P_1$  in the dark ink composition (i.e.  $B_1/P_1$ ) is lower than the ratio between the resin weight  
15 proportion  $B_2$  and the pigment weight proportion  $P_2$  in the light ink composition (i.e.  $B_2/P_2$ ), and in that  $B_1$  and  $B_2$  differ from each other.